Call for Papers

Abstract Due November 4, 2012

A World of Science and Technology

PACRIM10

The 10th Pacific Rim Conference on Ceramic and Glass Technology

including GOMD 2013 - Glass & Optical Materials Division Annual Meeting

June 2–7, 2013 | Hotel Del Coronado | San Diego, CA, USA

The American Ceramic Society
www.ceramics.org

Endorsed by: The Chinese Ceramic Society | The Korean Ceramic Society | The Ceramic Society of Japan | The Australian Ceramic Society
The Indian Ceramic Society | World Academy of Ceramics | The Brazilian Ceramic Society | The Thai Ceramics Society
The European Ceramic Society | Mexican Society of Materials

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Introduction

In 1993, various ceramic societies from countries bordering the Pacific Ocean worked together to form a series of international conferences. The first Pacific Rim Conference on Ceramic and Glass Technology was hosted by The American Ceramic Society in Hawaii. Since then, PACRIM conference have been held in various countries including Australia, Korea, Japan, China, and Canada. The 10th Pacific Rim Conference on Ceramic and Glass Technology (PACRIM 10) is the tenth in a series of conferences that provide a public forum for presentations and stimulating information exchange and discussion on the latest emerging ceramic and glass technologies. Over the years, PACRIM conferences have established an internationally prominent reputation for providing state-of-the-art presentations and insightful information exchange on emerging ceramic technology developments and applications. These meetings have facilitated global dialogue, discussion, and collaborations with leading world experts.

In addition to a plenary session entitled "Future Energy Challenges and Opportunities for Ceramics," the PACRIM 10 technical program will cover a wide range of very exciting topics and identify global challenges and opportunities for various ceramic technologies. The program will also generate important discussions on where particular fields are heading on a global scale. It also provides a very important forum for knowledge exchange and sharing, and facilitates the establishment of new contacts with peers from different continents.

I am also very excited to have strong participation from the Basic Science, Engineering Ceramics, Glass and Optical Materials (GOMD), Electronics, and the Nuclear and Environmental Divisions of The American Ceramic Society. In fact, GOMD is running its 2013 Annual Meeting as part of PACRIM 10. I would also like to thank all of our endorsing societies from Asia, Australia, Europe, and the Americas for working with us to make this conference a truly global event.

An International Richard M. Fulrath Symposium on the frontier of ceramic technologies for sustainable development is also planned. The Richard M. Fulrath award program was established to promote the friendship among Japanese and US researchers and scholars.

I sincerely would like to invite all of you to take advantage of this opportunity to visit the beautiful city of San Diego and actively participate in PACRIM 10. This conference will provide an excellent forum for interactions and friendships with participants from various continents, who are involved in research, development, engineering, manufacturing, and application of ceramics and glasses materials.

I look forward to your participation in PACRIM 10 in San Diego, California, which no doubt is one of America's finest cities.

Dr. H.T. Lin
Chairman, PACRIM 10
Oak Ridge National Laboratory, Oak Ridge, TN (USA)

Hotel Information

Hotel Del Coronado
1500 Orange Avenue
Coronado, CA 92118 (near San Diego)

Phone: (800) 468-3533
Phone: (619) 435-6611
Fax: (619) 522-8238

Rates:
Single/Double/Triple/Quad - $229.00
Visit the website for information on US Government Employee rate rooms.

Cut Off Date: May 3, 2013

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MULTI SCALE MODELING AND SIMULATION

Symposium 1: Advanced Characterization and Modeling of Ceramic Interfaces

Advances in understanding the role of grain boundaries and interfaces in ceramics have led to the design of ceramics for unique applications in energy, aerospace, nuclear, automotive, military and medical fields. Recent progress in characterization and computational materials science have significantly enhanced the optimization and the design of interfaces in new ceramic materials and devices. This symposium will focus on the forefront of characterization, design, and modeling of ceramic interfaces for facilitating the design of new ceramics with tailored properties. Relevant papers will cover a broader field of ceramic interfaces from grain boundaries, domain boundaries, surfaces and heterointerfaces, which are key to control materials properties.

Symposium Organizers

Naoya Shibata, The University of Tokyo, Japan
Katsuyuki Matsunaga, Nagoya University, Japan
Klaus van Benthem, University of California, Davis, USA
Albina Borisevich, Oak Ridge National Laboratory, USA
Wai-Yim Ching, University of Missouri-Kansas City, USA
Si-Young Choi, Korea Institute of Materials Science, Korea
Suk-Joong Kang, Korea Advanced Institute of Science and Technology, Korea
XiuLiang Ma, Institute of Metal Research, Chinese Academy of Sciences, China
Jingyang Wang, Institute of Metal Research, Chinese Academy of Sciences, China
Masato Yoshiya, Osaka University, Japan

Points of Contact:

Naoya Shibata, +03-5841-7756; shibata@sigma.t.u-tokyo.ac.jp
Katsuyuki Matsunaga, +81-52-789-3257; kmatsunaga@numse.nagoya-u.ac.jp

Symposium 2: Ceramics by Genome

This is a new symposium in response to the new Materials Genome Initiative (MGI) started in US and in many other advance countries worldwide. The goal is to "deploy advanced materials at least twice as fast as possible today and at a fraction of cost." The MGI encompasses the activities on developing common toolset, which can be used across the entire materials discovery-to-deployment that integrates advanced computational methods with data-enabled scientific

Proceedings

Authors of accepted abstracts will be invited to submit your paper for inclusion in the Ceramic Transactions, which will be published after the meeting and available for an additional fee.

Abstract Submission Instructions

Visit the meeting website at **www.ceramics.org/pacrim10** to review the session topics and select the "Submit Abstract" hyperlink to be directed to the Abstract Central website. Follow the prompts to create an account and submit your abstract online.

Please note that your ACerS member login and password will not work on this website. You will need to set up a new account login and password for the Abstract Central website. If you have questions, please contact Marilyn Stoltz at **mstoltz@ceramics.org** or 614-794-5868.

Tentative Schedule of Events

Sunday, June 2

Registration	3 pm – 7 pm
Welcome Reception	5 pm – 7 pm

Monday, June 3

Registration	7:30 am – 6 pm
Plenary Session	9 am – Noon
Concurrent Technical Sessions	1:20 pm – 6 pm

Tuesday, June 4

Registration	7:30 am – 6 pm
Concurrent Technical Sessions	8:30 am – Noon
Concurrent Technical Sessions	1:20 pm – 6 pm
Poster Session	5:30 pm– 8 pm

Wednesday, June 5

Registration	7:30 am – 12:30 pm
Concurrent Technical Sessions	8:30 am – Noon
Free Afternoon	

Thursday, June 6

Registration	8 am – 6 pm
Concurrent Technical Sessions	8:30 am – Noon
Concurrent Technical Sessions	1:20 pm – 6 pm
Evening Event	7 pm – 9:30 pm

Friday, June 7

Registration	8 am – Noon
Concurrent Technical Sessions	8:30 am – Noon

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discovery and innovative experimental techniques. It is anticipated that MGI will accelerate materials discovery and development by building the fundamental knowledge needed to progress towards designing and making materials with specific function or properties from first principles. The symposium focuses on different types of ceramic materials and structures with different approaches in both computational research and experimental measurements across the length and time scales in advancing our understanding of their interrelationship.

Symposium Organizers

Wai-Yim Ching, University of Missouri-Kansas City, USA

Isao Tanaka, Kyoto University, Japan

Jingyang Wang, Institute of Metal Research, Chinese Academy of Sciences, China

Anil Misra, University of Kansas, USA

Masanori Kohyama, AIST, Japan

Kwang-Ryeol Lee, KIST, Korea

Points of Contact:

Wai-Yim Ching, (816) 235-2503; chingw@umkc.edu

Isao Tanaka, +81-75-753-5465; tanaka@cms.MTL.kyoto-u.ac.jp

INNOVATIVE PROCESSING AND MANUFACTURING

Symposium 3: Novel, Green, and Strategic Processing and Manufacturing Technologies

The properties and performance of materials largely depend on their processing and manufacturing routes. Manufacturing processes carefully designed with sufficient understanding of forming/sintering behaviors lead to reliable performance of components and products of large size and complex shapes. Recently developed new processing and manufacturing technologies of ceramic materials and systems give us unique properties which cannot be achieved from the conventional routes. On the other hand, we should take into account at least two critical issues in making materials and products. One is that the technologies are "green" or environmentally benign so as to avoid generation of elements and compounds hazardous to the human health and environments and to protect the global environment by preserving energy during the fabrication. The other is that they are "strategic" or using no or less quantity of rare natural resources for stable production. Keeping these aspects in view, the aim of this symposium is to discuss advances in processing and manufacturing technologies for a wide variety of ceramic and related materials.

Symposium Organizers

Tatsuki Ohji, National Institute of Advanced Industrial Science and Technology (AIST), Japan

Mrityunjay Singh, Ohio Aerospace Institute, NASA Glenn Research Center, USA

Shaoming Dong, Shanghai Institute of Ceramics, China

Jow-Lay Huang, National Cheng Kung University, Taiwan

Hai-Doo Kim, Korea Institute of Materials Science, Korea

Eugene Medvedovski, Umicore Thin Film Products, USA

Alexander Michaelis, Fraunhofer IKTS, Germany

Lalit Kumar Sharma, Central Glass & Ceramic Research Institute, India

Richard D. Sisson, Jr., Worcester Polytechnic Institute, MA, USA

Hisayuki Suematsu, Nagaoka University of Technology, Japan

Nahum Travitzky, University of Erlangen-Nuremberg, Germany

Points of Contact:

Tatsuki Ohji, +81-52-736-7096; t-ohji@aist.go.jp

Mrityunjay Singh, (216) 433-8883; mrityunjay.singh-1@nasa.gov

Symposium 4: Polymer Derived Ceramics and Composites

Preceramic polymers, organic-inorganic polymers capable of being transformed into ceramics by heat treatment or non-thermal methods, continue to constitute an exciting research field at the interface between several disciplines. As the understanding of the structure at the nano-scale and the thermodynamics of these complex systems advances, control over properties becomes possible as well as the discovery of novel functionalities. The possibility of exploiting plastic-forming techniques or non-conventional processing methods has led to the fabrication of components suitable for a wide variety of applications in fields ranging from energy to health care, from defence to aerospace, from automotive to environment. The polymer-derived ceramic systems are also unique in their capability to combine elements and nanodomains that are not found in traditional ceramic

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materials or cannot be formed by conventional ceramic processing. This symposium aims at mapping the new developments in PDCs, from modelling and structural characterization to new properties and advanced polymer-to-ceramic conversion methods, providing also a forum for attracting young investigators to the field. A particular emphasis will be placed on nitrogen-containing PDCs, as they display an intriguing and unique set of structural and functional characteristics.

Symposium Organizers

Paolo Colombo, University of Padova, Italy
Yigal Blum, SRI International, USA
Gian Domenico Sorarù, University of Trento, Italy
Ralf Riedel, Technical University Darmstadt, Germany
Philippe Miele, University of Montpellier 2, France
Isabel Kinski, Fraunhofer Institute for Ceramic Technologies and Systems (IKTS), Germany
Raj Bordia, University of Washington, USA
Peter Kroll, The University of Texas Arlington, USA
Yuji Iwamoto, Nagoya Institute of Technology, Japan
Dong-Pyo Kim, Pohang University of Science and Technology, Korea
Yingde Wang, National University of Defence Technology, Changsha, China

Points of Contact:

Paolo Colombo, +39-049-827-5825; paolo.colombo@unipd.it
Yigal Blum, (650) 859-4367; yigal.blum@sri.com

Symposium 5: Advanced Powder Processing and Manufacturing Technologies

Powder processing is not only crucial for producing highly reliable advanced ceramics at low costs, but also contributes to the creation of enhanced functionalities of advanced ceramics leading to many new applications in the high-tech industries, clean energy, energy-saving and sustainable society. To achieve these objectives, the processes related to powder design and synthesis, suspension control, structural control of granule, green body and sintered ceramics must be fully developed and well-understood.

Symposium Organizers

Makio Naito, Joining and Welding Research Institute (JWRI), Osaka University, Japan
Junichi Tatami, Yokohama National University, Japan
Lennart Bergstroem, Stockholm University, Sweden
Yuji Hotta, National Institute of Advanced Industrial Science and Technology (AIST), Japan
C. C. Huang, Hosokawa Micron Powder Systems, USA
Norifumi Isu, LIXIL Corp., Japan
Hai-Doo Kim, Korea Institute of Machinery & Materials (KIMM), Korea
Satoshi Tanaka, Nagaoka University of Technology, Japan
Tetsuo Uchikoshi, National Institute of Materials Science (NIMS), Japan

Sujanto Widjaja, Corning Incorporated, USA
Di Zhang, Shanghai Jiao Tong University, China

Points of Contact:

Makio Naito, +81-6-6879-8660; m-naito@jwri.osaka-u.ac.jp
Junichi Tatami, +81-45-339-3959; tatami@ynu.ac.jp

Symposium 6: Synthesis and Processing of Materials Using Electric Fields/Currents: A Symposium Honoring Prof. Zuhair Munir

This symposium will honor Prof. Z.A. Munir for his outstanding contributions to the field of processing materials using electric currents and fields. Electric fields and currents have been demonstrated to be effective in processing materials with unique properties and/or increasing processing efficiency. Of particular note is the wide spread application of currents for the consolidation of powders (often referred to as Spark Plasma Sintering (SPS), Field Assisted Sintering Technique (FAST), Current Activated Pressure Assisted Densification (CAPAD) among others). This symposium is in the spirit of previous symposia on SPS that were held in conjunction with past PACRIM meetings beginning in PACRIM 7, Hawaii. The success of these symposia provided evidence of the continued worldwide growth of research and development activities in this field.

The symposium is aimed at providing a forum for scientists and engineers to present and discuss results of various observations on a wide variety of topics related to current assisted processing and synthesis of materials. Experimental and modeling papers

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covering both fundamental as well as application-oriented studies are solicited.

Symposium Organizers

Javier E. Garay, University of California, CA
Manshi Ohyanagi, Ryukoku University, Japan
Eugene A. Olevsky, San Diego State University, CA
Masao Tokita, SPS SYNTEX INC, Japan

Point of Contact:

Javier E. Garay, (951) 827-2449; jegaray@engr.ucr.edu

NANOTECHNOLOGY AND STRUCTURAL CERAMICS

Symposium 7: Multifunctional Metal Oxide Nanostructures and Heteroarchitectures for Energy and Device Applications

Metal oxides represent an assorted and appealing class of materials whereby the field of metal oxide nanostructured morphologies has become one of the most active research areas within the nano-science community. All the involved researchers are continuously proposing new fundamental research together with original and inspired potential applications, including nanostructures and heterostructures thereof for electronics, photonics, sensor technology, energy conversion and storage, and interfacing nanowires with living cells.

This symposium will focus on science and engineering of nanostructured materials, with a strong focus on the recent innovation in nanotechnological approaches and their impact on the current challenges of energy and sustainability. In particular, special emphasis will be given to novel synthesis appraoches, functionalization, processing, and characterization of nanoparticles, nanowires and their heterostructures. Application of nanostructures in drug-delivery, catalysis, energy and sensing applications, nanocomposites in structural light weight materials, nansotructured coatings for photovoltaic, bio-medical and optical applications will form the major thrust areas.

Symposium Organizers

Sanjay Mathur, University of Cologne, Germany
Taejin Huang, Korea Institute of Industrial Technology, Korea
Hidehiro Kamiya, University of Tokyo, Japan
Yasuhiro Tachibana, RMIT, Australia
Gregory Loh, A*Star, Singapore
Z. Jiao, Shanghai University, China
Jow-Lay Huang, NCKU, Taiwan
Giorgio Sberveglieri, University of Brescia, Italy

Points of Contact:

Sanjay Mathur, +49-221-470-2292; sanjay.mathur@uni-koeln.de
Taejin Hwang, +82-32-8500-238; greathtj@kitech.re.kr

Symposium 8: Engineering Ceramics and Ceramic Matrix Composites: Design, Development, and Applications

Advanced ceramic and composite materials offer unique properties that have the potential to fulfill the demanding materials needs in applications such as aerospace, automotive, energy, environment, and microelectronics. Globally, significant progress has been made in the development of ceramics and composites. However, challenges remain in increasing their penetration into the marketplace. The purpose of this symposium is to provide a forum to the scientists and engineers from around the world to present and discuss their recent advances in the area of engineering ceramic and composites.

Symposium Organizers

Dileep Singh, Argonne National Laboratory, USA
Laifei Cheng, Northwestern Polytechnical University, China
Yi-Bing Cheng, Monash University, Australia
Shaoming Dong, Shanghai Institute of Ceramics, China
Andrew Gyekeneski, NASA Glenn Research Center, USA
Michael Halbig, NASA Glenn Research Center, USA
Wei-Hsing Tuan, National Taiwan University, Taiwan
Yutaka Kagawa, University of Tokyo, Japan
Hagen Klemm, ITRS, Dresden, Germany

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Walter Krenkel, University of Bayreuth, Germany
Gregory Morscher, University of Akron, USA
Raj Tandon, Sandia National Laboratories, USA
Shanghua Wu, Guangdong University of Technology, China

Points of Contact:
Dileep Singh, (630) 252-5009; dsingh@anl.gov
Shaoming Dong, +86-2152414324; smdong@mail.sic.ac.cn

Symposium 9: Materials for Extreme Environments: Ultrahigh Temperature Ceramics (UHTCs) and Nanolaminated Ternary Carbides and Nitrides (MAX Phases)

Ultrahigh temperature ceramics (UHTCs) and nanolaminated ternary carbides and nitrides (MAX phases) are potential materials for use in extreme environments such as scramjet engine components, leading edges and thermal protection systems for hypersonic vehicles, and cladding materials in generation IV nuclear reactors. However, their thermal/chemical stability in extreme environments, the ability to be formed into complex shapes/sharp edges, thermal shock resistance, irradiation resistance, and damage tolerance are all critical issues limiting the near-term applications of these materials. Consequently, further research is needed to understand the multi-scale structure-property relationships of existing systems; design new compositions/composites; investigate new approaches for improving the thermal shock resistance, thermochemical stability, damage tolerance and machinability; and develop novel processing methods for bulk ceramics and coatings. This symposium will focus on design, processing, structure-property relationships, thermal and mechanical properties, oxidation resistance, machining and joining, and stability of UHTCs and MAX phases both from fundamental and application-oriented perspectives.

Symposium Organizers
Yanchun Zhou, Aerospace Research Institute of Material & Processing Technology, China
Jon Binner, Loughborough University, UK
Erica L. Corral, The University of Arizona, USA
Per Eklund, Linköping University, Sweden
William G. Fahrenholtz, Missouri University of Science and Technology, USA
Frederic Monteverde, Institute of Science and Technology of Ceramics-CNR, Italy
Miladin Radovic, Texas A&M University, USA
Jochen Schneider, Materials Chemistry, RWTH Aachen, Germany
Luc J Vandeperre, Imperial College London, UK
Guo-Jun Zhang, Shanghai Institute of Ceramics, Chinese Academy of Sciences, China

Point of Contact:
Yanchun Zhou, +86(01) 6838-2478; yczhou714@gmail.com

Symposium 10: Advanced Ceramic Coatings: Processing, Properties, and Applications

This symposium focuses on recent advances in ceramic coatings development, evaluation of microstructures and properties, and novel coatings applications. Particular emphasis is placed on integrated structural properties, environmental properties and functionality through innovative coating processing; composition and architecture optimization; advanced coatings for extreme environments and life prediction modeling.

Symposium Organizers
Dongming Zhu, NASA Glenn Research Center, USA
Yutaka Kagawa, University of Tokyo, Japan
Daniel R. Mumm, University of California, Irvine, USA
Douglas E. Wolfe, The Pennsylvania State University, USA
Andi M. Limarga, United Technologies Research Center, USA
Dong-Soo Park, Korea Institute of Materials Science, Korea
Ping Xiao, University of Manchester, UK
Charles Lewinsohn, Ceramatec, Inc., USA
Byung-Koog Jang, National Institute for Materials Science, Japan
Diptiranjan Sahu, University of the Witwatersrand Johannesburg, South Africa
Kyoung Il Moon, Korea Institute of Industrial Technology, Korea

Points of Contact:
Dongming Zhu, (216) 433-5422; Dongming.Zhu@nasa.gov
Kyoung Il Moon, +82-32-8500-263; kimoon@kitech.re.kr

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Symposium 11: Geopolymers – Low Energy, Environmentally Friendly, Inorganic Polymeric Ceramics

Geopolymers are inorganic polymers formed from naturally occurring aluminosilicates by reaction with concentrated alkali solutions at near ambient temperatures. Other inorganic polymers include phosphates. Recent research has revealed the versatility of these materials for many applications, such as fire resistant panels, acid and brine resistant materials, biomaterials, electronic materials, materials for immobilizing/encapsulation of hazardous metal ions and low and intermediate level nuclear waste. They can be used in construction applications where ceramics and Portland cement are used. In fact the potential to produce new materials with applications even not thought of at present is enormous. In this symposium some of these new developments will be examined and explored.

Symposium Organizers

Waltraud M. Kriven, University of Ilinois at Urbana-Champaign, USA
Arie van Riessen, Curtin University, Australia
Dan Perera, ANSTO, Australia
Kyoshi Okada, Tokyo Institute of Technology, Japan
Wanchai Yodsudjai, Kasetsart University, Thailand
Tomas Hanzlicek, Academy of Science of the Czech Republic, Czech Republic
Ken MacKenzie, Victoria University of Wellington, New Zealand

Points of Contact:

Waltraud M. Kriven, (217) 333-5258; kriven@illinois.edu
Arie van Riessen, A.VanRiessen@curtin.edu.au

MULTIFUNCTIONAL MATERIALS AND SYSTEMS

Symposium 12: Advances in Electroceramics

Electronic ceramics have been used in a wide variety of modern electronic circuits and have seen tremendous growth worldwide over the last few decades. Properties of electronic ceramics include dielectricity, ferroelectricity, piezoelectricity, several transport properties of electrons & ions, and magnetic and optical properties. These properties are enabling the use of electroceramics for a number of demanding applications in electronic devices for communications, automotive, modern mechatronics and bio-technologies. Most of these applications require high performance and reliable materials. However, significant scientific and technical challenges still remain for understanding fundamental aspects of materials, improving processing technologies and material properties to meet the demands in applications. The purpose of this symposium is to provide an international forum for scientists, engineers, and technologists to discuss and exchange ideas in fundamental theories, processing technologies, property evaluations and applications of a wide variety of electronic ceramics. This symposium is intended to bring together scientists, engineers, research staff and students from universities, research institutes and related industrial companies, active in the field of electronic ceramics.

Symposium Organizers

Jun Akedo, National Institute of Advance Industrial Science & Technology, Japan
Yuji Noguchi, University of Tokyo, Japan
David Cann, Oregon State University, USA
Paul Muralt, Materials Institute EPFL, Switzerland
Sang Sub Kim, Inha University, Korea
Haosu Luo, Chinese Academy of Science, China
Ling Bing Kong, Nanyang Technological University, Singapore

Point of Contact:

Jun Akedo, +81-29-861-7228; akedo-j@aist.go.jp

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Symposium 13: Microwave Materials and Their Applications

Microwave and millimeterwave materials designed for wireless communications have been a booming area of growth recently. The latest communication technologies with highly intelligent devices are applying in mobile multimedia systems, ultrahigh speed wireless local area network (LAN) and intelligent transport systems (ITS) etc. For a new ubiquitous computer age, therefore, the superior performance microwave and millimeterwave materials and devices are required. This symposium provides a forum for the worldwide microwave community to discuss such topics as materials development, design, measurement techniques, applications, technology trends and market demands. The conference provides the ideal opportunity to share and discuss ideas about the latest scientific and technological advances and meet with colleagues from a wide variety of backgrounds.

Symposium Organizers

Xiang Ming Chen, Zhejiang University, China
Robert Freer, University of Manchester, UK
David Cruikshank, Skyworks, USA
Danilo Suvorov, Jozef Stefan Institute, Slovenia
Heli Jantunen, University of Oulu, Finland
Eung Soo Kim, Kyonggi University, Republic of Korea
Mailadil T. Sebastian, National Institute for Interdisciplinary Science and Technology, India,
Takeshi Shimada, Hitachi Metals, Ltd., Japan
Rick Ubic, Boise State University, USA
Hitoshi Ohsato, Nagoya Institute of Technology, Japan
Hong Wang, Xi'an Jiaotong University, China.

Point of Contact:

Xiang Ming Chen, +86-571-87952112; xmchen59@zju.edu.cn

Symposium 14: Oxide Materials for Nonvolatile Memory Technology and Applications

Nonvolatile semiconductor memory (NVSM) can work as a standalone nonvolatile memory or an embedded memory. NVSMs are widely applied in advanced computer, consumer, and communication (3C) electronic systems. Today the mainstream NVSM is flash memory. However, flash memory has drawbacks, such as high operation voltage, low operation speed, and poor retention time due to the increasing leakage current with device scaling. Therefore, various emerging nonvolatile memories have been proposed to possibly replace conventional flash memory. These alternative memories include ferroelectric memory, phase change memory, magnetic memory, and resistive switching memory. Oxide materials are important elements in future flash memory and alternative memories. For technological applications, high performance and reliability are required, which strongly depend on the fundamental aspects of oxide materials, processing technologies and their properties. The purpose of this symposium is to provide a platform for leading researchers on nonvolatile memory materials and technology worldwide to discuss and exchange their ideas, to prospect the development of the field of memory materials and technology, and to share their valuable experiences.

Symposium Organizers

Tseung-Yuen Tseng, National Chiao Tung University, Taiwan
Ryuji Ohba, Toshiba Corporation, Japan
Daniele Ielmini, Politecnico di Milano, Italy
I-Wei Chen, University of Pennsylvania, USA
Jean-Pierre Leburton, University of Illinois at Urbana-Champaign, USA
Fu-Liang Yang, National Nano Device Laboratories, Taiwan
Ming Liu, Chinese Academy of Sciences, China

Points of Contact:

Tseung-Yuen Tseng, 886-3-5731879; tseng@cc.nctu.edu.tw
Daniele Ielmini, +39-02-2399-6120; ielmini@elet.polimi.it

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CERAMICS FOR ENERGY AND ENVIRONMENT

Symposium 15: Solid Oxide Fuel Cells and Hydrogen Technology

Worldwide interest in solid oxide fuel cells (SOFCs), as a promising future electricity-generation technology, has remarkably increased in recent years due to their high electrical efficiency and multi-fuel capability (hydrogen, carbon monoxide, methane, etc.). Recent developments in engineered electrode architectures, component materials chemistry, cell and stack designs, and fabrication processes have led to significant improvements in the electrical performance and performance stability as well as reduction in the operating temperature of such cells. Although their development still faces various problems with high-temperature materials, design of cost-effective materials and manufacturing processes, SOFCs are expected to enter the commercial markets in the near future. Hydrogen economy as an emerging energy alternative relies on development of novel materials to realize the promise and expectation for a cleaner environment. Material needs and technologies in the areas of hydrogen production, storage, delivery and safety will be addressed in conjunction with hydrogen-based alternative energy sources. Papers are solicited on all aspects of SOFCs and hydrogen energy.

Symposium Organizers

Fatih Dogan, Missouri University of Science and Technology, USA
Masanobu Awano, National Institute of Advanced Industrial Science and Technology, Japan
Mogens B. Mogensen, Technical University of Denmark, Denmark
Alexander Michaelis, Fraunhofer Institute of Ceramic Technologies and Systems (IKTS), Germany
Jooho Moon, Yonsei University, Korea
Sea-Fue Wang, National Taipei University of Technology, Taiwan

Points of Contact:

Fatih Dogan, (573) 341-7130; doganf@mst.edu
Masanobu Awano, 81-52-736-7103; masa-awano@aist.go.jp

Symposium 16: Direct Thermal to Electrical Energy Conversion Materials and Applications

Recently, there have been significant advances in direct thermal-to-electrical energy conversion materials. This symposium will highlight a combination of new theoretical ideas, new materials and new device concepts. It will focus on novel materials, various processing and synthesis methods along with technologies and applications related to direct thermal-to-electric energy conversion, specifically: thermoelectrics (TE), and thermionics. Thermal, electrical and mechanical properties of new materials and the processing of those materials into device structures will be emphasized. The symposium also intends to highlight material & device-design innovations that lead to higher efficiency thermal to electric energy conversion technologies. Theoretical studies of transport properties, band structure and crystal chemistry of materials, thermodynamic analysis and energy transfer will also be included. Experimental efforts will include new capabilities in solid-state synthesis, new bulk materials, thin films, superlattices and nanostructured materials. Specifically, we will highlight recent advances in the ever-growing field of thermoelectric nanocomposites, which are nano materials or inherent nanostructures in a bulk thermoelectric material matrix. We will also highlight advances in the use of spark plasma sintering in the development of high performance TE materials. New developments in material property and device performance measurements and metrology will be presented.

Symposium Organizers

Terry M. Tritt, Clemson University, USA
Kunihito Koumoto, Nagoya University, Japan
T. J. Zhu, Zhejiang University, China
Chan Park, Seoul National University, Korea
Sidney Lin, Lamar University, USA

Point of Contact:

Terry M. Tritt, (864) 656-5319; ttritt@clemson.edu

Symposium 17: Photovoltaic Materials and Technologies

The significant increase in demand of world energy consumption as well as clean and efficient energy resources, have prompted the imperative searches of new materials and technologies. The technologies aiming for the effective and efficient use of solar energy is now one of the top priority to guarantee

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sustainable growth and development of the present society. This symposium will focus on the advanced ceramics and glass materials technologies including semiconductor, electrical and thermal conductive/storage materials that could help to achieve the stated goals. A broad perspective is desired including photovoltaic materials, solar cell and solar-energy conversion systems for better energy efficiency; fundamental materials properties and characterization of solar-energy conversion, state-of-the art of solar cell materials and architectures, structure-property correlations, and materials development and processing technologies for reliable and efficient solar-energy conversion and related technologies are also highly desired.

Symposium Organizers

Tohru Sekino, Tohoku University, Japan
Yoshikazu Suzuki, Tsukuba University, Japan
Udo Bach, Monash University, Australia
Yi-Bing Cheng, Monash University, Australia
Nam-Gyu Park, Sungkyunkwan University, Korea
Shinobu Fujihara, Keio University, Japan
Yanfeng Gao, Shanghai Institute of Ceramics, China
Jyh-Ming Ting, National Cheng Kung University, Taiwan
Young-Ho Choa, Hanyang University, Korea
Michael Scheffler, Brandenburg Technical University of Cottbus, Germany
Franziska Scheffler, Bavarian Center for Applied Energy Research, Germany

Points of Contact:

Tohru Sekino, +81(22)217-5832; sekino@tagen.tohoku.ac.jp
Yoshikazu Suzuki, +81(29)853-5026; suzuki@ims.tsukuba.ac.jp
Udo Bach, +61(3)990-56264; Udo.Bach@monash.edu

Symposium 18: Ceramics for Next Generation Nuclear Energy

The next generation nuclear energy, from the accident-tolerant light water reactors to the future fusion energy, is among key technologies toward the sustainable, low-carbon society. Advanced ceramics, ceramic matrix composites, and carbon materials are unique enabling materials that withstand the high temperatures, intense radiation, and chemically harsh environments specific to fission and fusion energy systems. Moreover, these materials have the potential to advance radiation detection and secure waste immobilization. The purpose of this symposium is to provide a forum to the materials scientists and nuclear engineers from around the world to present and discuss the current state-of-the-art of all aspects of advanced ceramics, composites, and carbon materials for nuclear energy. This symposium is endorsed by Advisory Committee on Application of Ceramic Materials for Advanced Atomic Energy Systems, Atomic Energy Society of Japan.

Symposium Organizers

Yutai Katoh, Oak Ridge National Laboratory, USA
Charles Henager, Pacific Northwest National Laboratory, USA
Akira Kohyama, Muroran Institute of Technology, Japan
Christina Back, General Atomics, USA
Shannon Bragg-Sitton, Idaho National Laboratory
Yi-Bing Cheng, Monash University, Australia
Shaoming Dong, Shanghai Institute of Ceramics, CAS, China
Michael Jenkins, Fresno State University, USA
Ji-Jung Kai, National Tsing Hua University, Taiwan
Fumihisa Kano, Toshiba Corporation, Japan
Ji Yeon Park, Korea Atomic Energy Research Institute, Korea
Shuming Peng, Institute of Nuclear Physics and Chemistry, China
Lance Snead, Oak Ridge National Laboratory, USA
Toyohiko Yano, Tokyo Institute of Technology, Japan

Points of Contact:

Yutai Katoh, 865-576-5996; katohy@ornl.gov
Charles Henager, chuck.henager@pnnl.gov
Akira Kohyama, kohyama@mmm.muroran-it.ac.jp

Symposium 19: Advances in Photocatalytic Materials for Energy and Environmental Applications

As global population growth and economical development continue to ramp up, sustainable energy supply and environmental concerns are emerging among the top issues and challenges for humanity. In addressing these challenging issues, innovative materials are essential enablers. Semiconducting photocatalytic materials have found multi-functional properties which underpin many important energy conversion applications including photocatalytic environmental remediation, water splitting for hydrogen fuel, CO_2 reduction, self-cleaning coatings, electrochromic devices and sensors, and low cost solar cells. In the meantime, fundamental understanding and innovative design of semiconducting nanomaterials are of particular importance in further improving the energy conversion efficiency of the materials by using our abundant solar energy. The main objective of the workshop is to promote international cooperation and partnership between world leaders in the fields of nanomaterials for solar energy applications.

Symposium Organizers

Lianzhou Wang, The University of Queensland, Australia
Xiaobo Chen, University of Missouri—Kansas City, USA
Seong-Ju Hwang, Ewha Womans University, Korea
Gongxuan Lu, Lanzhou Institute of Chemcial Physics, China
Lionel Vayssieres, National Institute for Materials Science, Japan
Michael Wark, Ruhr University Bochum, Germany
Songyuan Dai, Institute of Plasma Physics, China

Points of Contact:

Lianzhou Wang, +61-7-3365-4218; l.wang@uq.edu.au
Xiaobo Chen, chenxiaobo@umkc.edu

Call for Papers Abstract Due November 4, 2012

Symposium 20: Ceramics Enabling Environmental Protection: Clean Air and Water

As humanity improves its standard of living, the demand for energy, housing, transportation, agricultural, and industrial products increases as well. However, higher rates of production go hand-in-hand with higher pollution rates which can lead to global climate change. New technical solutions are required to address this problem. The objective of this symposium is to provide an international forum to review ceramic technologies that can be applied in addressing global challenges related to clean air and water. Symposium will focus on ceramic technologies as enablers for (i) removal of pollutants that are already present in the environment, (ii) reduction or elimination of future pollution sources, and (iii) development of new processes and products with respect to efficiency, economy, ecology and reduced resource consumption. The scope of the symposium extends from recent scientific breakthroughs in materials, processing and systems design that help environmental protection to implementation of these improvements into already existing and new product applications.

Symposium Organizers

Aleksander J. Pyzik, The Dow Chemical Company, USA
Michael J. Lance, Oak Ridge National Laboratory, USA
Hai-Doo Kim, Korea Institute of Materials Science, Korea
Hasan Mandal, Sabanci University, Turkey
Louis Winnubst, University of Twente, Netherlands
Yuji Iwamoto, Nagoya Institute of Technology, Japan
Kevin Plucknett, Dalhousie University, Canada

Points of Contact:

Aleksander J. Pyzik, (989) 636-8801; apyzik@dow.com
Michael J. Lance, (865) 241-4536; lancem@ornl.gov

Symposium 21: Advanced Materials and Technologies for Electrochemical Energy Storage Systems

During the last two decades, research groups in Asia, Europe, and North America have developed cathode and anode materials and electrolytes that can be used in electrochemical couples that store more and more electricity per mass and volume. As a result of these advances, lithium-ion battery technology has evolved beyond the consumer electronics industry and is now making serious inroads in the transportation industry; still, challenges at the battery system level remain with regard to energy, power, cost, life, and safety. Also, the technology is slowly making inroads in other industries such as stationary storage systems for wind farms and solar plants. Improvements in materials design, electrodes architecture, and cell chemistry are required to extend the life, enhance the safety, and lower the cost of rechargeable lithium-ion batteries. A deeper understanding of the battery materials/property relationship, electrode/electrolyte interface phenomena, and cell failure mechanisms is also needed to face these challenges. The search for advanced high capacity electrode materials and the implementation of the very challenging lithium-sulfur and lithium-air batteries will be necessary to overcome the energy density shortfall in current lithium-ion batteries. Abstracts are solicited on the fundamental and applied aspects of rechargeable lithium-ion batteries, lithium-sulfur and lithium-air batteries, and beyond lithium technologies. This symposium will allow for discussion amongst the many groups involved in the development and use on these technologies.

Symposium Organizers

Ilias Belharouak, Argonne National Laboratory, USA
Palani Balaya, National University of Singapore, Singapore
Sung-Yoon Chung, Inha University, Korea
Yoshio Ukyo, Toyota, Japan
She-Huang Wu, Tatung University, Taiwan

Points of Contact:

Ilias Belharouak, (630) 252-445; belharouak@anl.gov
Palani Balaya, +65-6276-8177; mpepb@nus.edu.sg
She-Huang Wu, 886-2-25922458; shwu@ttu.edu.tw

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Symposium 22: Glasses and Ceramics for Nuclear and Hazardous Waste Treatment

The symposium will focus on the use of glasses, glass-ceramics and ceramics for the treatment of nuclear and hazardous wastes. The renewed interest in nuclear power generation and fuel reprocessing means that the processing, properties and testing of traditional glass and cementitious materials suitable for nuclear waste immobilization need to be expanded to meet the future needs. Additionally, increasing stringent environmental regulations increase the requirements for suitable treatment and stabilization of many hazardous constituents resulting from industrial processes which will increasingly involve glass and ceramic matrices. Topics will include the use of mature immobilization techniques such as vitrification, and the role of cementitious materials in both the stabilization of waste and the structural integrity of wasteforms. Alternative low-temperature wasteforms such as hydroceramics and geopolymers will be also considered as well as high-temperature glass composite materials. The symposium will cover materials technologies for the treatment of nuclear, hazardous and toxic wastes, which includes waste immobilization and encapsulation in inert matrices. New and innovative applications of materials and materials processes and alternative wasteform materials and processing methods will be highlighted. Additional topics include characterization and testing techniques for wasteforms and modeling of their behaviour over long timescales. Wasteform performance and accelerated testing to assess durability will be also covered. This symposium is co-sponsored by the ICG–Technical Committee on Nuclear and Hazardous Waste Vitrification, ACerS Nuclear and Environmental Technology Division, ACerS Glass and Optical Materials Division, and the Technical Committee on Nuclear Ceramics of the International Ceramics Federation.

Symposium Organizers

Aldo R. Boccaccini, University of Erlangen-Nuremberg, Germany
James Marra, Savannah River National Laboratory, USA
Russell Hand, University of Sheffield, UK
Bill Lee, Imperial College London, UK
John Vienna, Pacific Northwest National Laboratory, USA

Points of Contact:

Aldo R. Boccaccini, +49-9131-85-28601; aldo.boccaccini@ww.uni-erlangen.de
James Marra, (803) 725-5838; james.marra@srnl.doe.gov

CERAMICS IN BIOLOGY, MEDICINE, AND HUMAN HEALTH

Symposium 23: Advances in Biomineralized Ceramics, Bioceramics, and Bioinspired Designs

Research that combines ceramics and biology has generated significant interest in recent years. Biomineralization is the basis to understanding self-assembled growth of mineralized tissues whether it is in bone, seashells, eggs, crustaceans or diatoms. Understanding the influence of the organic/inorganic interaction is paramount to this understanding. Organic/inorganic interactions also occur in implantable bio- and bioactive ceramics used in, for example, dental and orthopedic applications. Bioinspired materials designs have focused on forming ordered assemblies of organic/inorganic constituents with the potential to be mechanically robust. This symposium will address these topics as well as the development of new materials, bioactive ceramics, porous bioceramics, self-assembly, nanostructured materials, biocompatibility, mechanical properties and other topics that focus on ceramics in a biological environment or the fabrication of ceramic structures in a biological fluid or other organic substance.

Symposium Organizers

Po-Yu Chen, National Tsing Hua University, Taiwan, ROC
Laurie Gower, University of Florida, USA
Joanna McKittrick, University of California, USA
Rizhi Wang, University of British Columbia, Canada
Hyoun-Ee Kim, Seoul National University, Korea

Points of Contact:

Joanna McKittrick, (858) 534-5425; jmckittrick@ucsd.edu
Laurie Gower, (352) 846-3336; lgowe@mse.ufl.edu

Symposium 24: Nanostructured Bioceramics and Ceramics for Biomedical Applications

Recent advances in nanostructured ceramics for medical and dental applications have resulted from two complementary forces. First, there is a natural movement from the microscale to the nanoscale as novel processing,characterization, and modeling techniques become available. Second, nanostructured ceramics provide exceptional capabilities for specialized interactions with proteins, DNA, viruses, and other biological structures. In addition, novel techniques for processing, characterizing, and modeling ceramic materials are being developed that will facilitate improvements in medical and dental treatment. This symposium will allow for discussion among the many groups involved in the development and use of ceramics for medical and dental applications, including ceramic researchers, medical device manufacturers, and clinicians.

Symposium Organizers

Roger J. Narayan, University of North Carolina and North Carolina State University, USA
Min Wang, The University of Hong Kong
Markus Reiterer, Medtronic, USA
Suwan Jayasinghe, University College London, United Kingdom
Chikara Ohtsuki, Nagoya University, Japan
Akiyoshi Osaka, Okayam University, Japan
Rizhi Wang, University of British Columbia, Canada

Points of Contact:

Roger J. Narayan, (919) 696-8488; roger_narayan@unc.edu
Min Wang, +852-2859-7903; memwang@hku.hk

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2013 GLASS AND OPTICAL MATERIALS DIVISION ANNUAL MEETING

SYMPOSIUM A: Glass Science

This symposium will highlight recent developments in fundamental glass science. While the synthesis of glassy materials has been optimized over centuries, the detailed mechanisms of glass formation remain one of the most fascinating yet not fully explained topics of modern solid state science. The lack of periodicity and thermodynamic stability are the two main characteristics that differentiate glasses from crystal counterparts, which in many ways lead to the advantageous properties that have enabled a wide range of technological applications of glasses. These same characteristics also make the study of glasses far more complex and challenging for structural and thermodynamic characterization. This symposium will address all aspects of glass science including processing, structure-property relationships, computational modeling, relaxation processes, surface processes, and non-oxide glasses.

Symposium Organizers

Jincheng Du, University of North Texas, USA
Pierre Lucas, University of Arizona, USA
Kostya Trachenko, Queen Mary's College, UK
John McCloy, Pacific Northwest National Laboratory, USA

Point of Contact:

John McCloy, (509) 372-4964; john.mccloy@pnnl.gov

SYMPOSIUM B: Glass Technology and Cross-Cutting Topics

This symposium will showcase current developments in cross-cutting topics in the area of glass technology and applications. Because of their nature, glasses can be melted, molded, drawn, pressed, fiberized, and shaped at multiple scales while still retaining exceptional physical and other properties. These characteristics of glass have led to functionalities and applications in many fields of technology including energy storage, electronics, optics, and engineering. Some of the proposed topics for this symposium include glass melting, thermal processing, and glass-ceramics production. Additionally, papers on environmental effects on glasses and optical materials related to radiation damage and corrosion are encouraged. Finally, a special session on the use of ultrafast spectroscopy techniques in glass and ceramics science and engineering is planned.

Symposium Organizers

Kelly Simons-Potter, University of Arizona, USA
Steve Martin, University of Iowa, USA
S. K. Sundaram, Alfred University, USA

Point of Contact:

S. K. Sundaram, (607) 871-2789; sundaram@alfred.edu

SYMPOSIUM C: Glasses for Optoelectronic and Optical Applications

Historically, glasses have played a central role in the development of optical and photonic technologies such as lenses, mirrors, and telecommunication networks. From fiber laser amplifiers to integrated optical circuitry, glasses enable new optical technologies. Glasses continue to be the most flexible and tailorable materials for the design and development of both passive and active optical devices. This symposium will cover all topics related to glasses for photonic and optoelectronic applications. Development of glasses with new optical as well as combination of optical and electrical properties is of interest. This includes but is not limited to, luminescent materials for active device, photosensitivity and optical processing of glass, glass fibers and sensors and optoelectronic devices.

Symposium Organizers

Mark Davis, Schott, USA
Norman Anheier, PNNL, USA

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Kathleen Richardson, Clemson University, USA
John Ballato, Clemson University, USA
Hideo Hosono, Tokyo Institute of Technology, Japan
Heike Ebendorff-Heidepriem, University of Adelaide, Australia

Point of Contact:
Heike Ebendorff-Heidepriem, heike.ebendorff@adelaide.edu.au

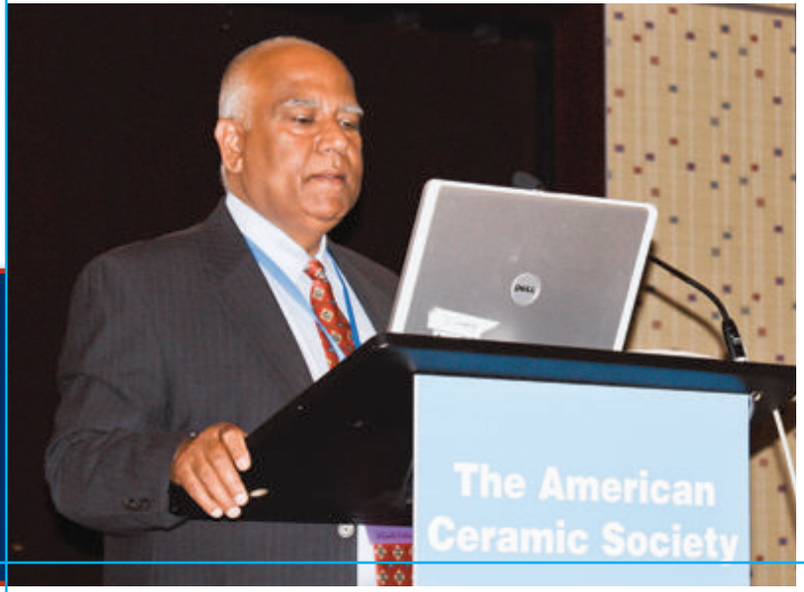
SYMPOSIUM D: James C. Phillips Honorary Symposium

This symposium is held in honor of the extraordinary research career of James C. Phillips, who has made revolutionary contributions to condensed matter physics every decade for over half a century. Phillips first rose to fame in the late 1950s with his invention of pseudopotential theory, the basis for more than 30,000 published articles concerning the electronic structure of materials. In the 1960s, Phillips developed the microscopic theory of superconductive tunneling and also an exact theory for the ionicity of chemical bonding. Phillips invented the topological constraint theory of compact networks in the 1970s, with particular application to optimization of glassy networks. In the 1980s, Phillips developed the theory of high temperature superconductors as self-organized networks. He followed this in the 1990s with the discovery of a bifurcated solution to stretched exponential relaxation in disordered networks. Most recently, in the 21st century, Phillips has connected the ideas of self-organized criticality to biological systems for the design of proteins and cancer-fighting oncolytic viruses. His exceptional contributions to basic and applied physics have resulted in >500 journal publications and four books, including the classic text *Bonds and Bands in Semiconductors*. In this symposium, colleagues and friends will pay tribute to the amazing lifelong career of J. C. Phillips. Contributed talks are also welcome in any of the sessions below. This symposium is sponsored by Corning Incorporated.

Symposium Organizers

John C. Mauro, Corning Incorporated, USA
Punit Boolchand, University of Cincinatti, USA
Matthieu Micoulaut, Université Pierre et Marie Curie, France

Point of Contact:
John C. Mauro, (607) 974-2185; mauroj@corning.com



2ND INTERNATIONAL RICHARD M. FULRATH SYMPOSIUM ON "FRONTIERS OF CERAMICS FOR SUSTAINABLE DEVELOPMENT"

Richard M. Fulrath award was started to honorably promote technical and personal friendships between Japanese and American professional ceramic engineers/scientists and encourage understanding among the diverse cultures surrounding the Pacific Rim. In its more than thirty year history, this award has made major contributions in this area. Over the last few decades, all the Fulrath award winners have made significant contributions to various areas of ceramics for sustainable society. As increasing global population drives to improve their standards of living, the demand for energy, healthcare, housing, transportation, and industrial products also grows rapidly. However, the higher demand and production in all these areas leads to a dramatic increase in the overall consumption of resources and rate of pollution leading to climate change that creates the risk of irreversible changes in ecosystem. New technologies and innovative solutions are required to address these needs. This symposium will address the critical role of advanced ceramic materials and technologies in solving various societal challenges. The technical program will cover wide ranging topics and identify key challenges and opportunities for various ceramic technologies in creating sustainable development.

– Ceramics for Sustainable Energy and Environmental Systems
– Ceramics in Medicine and Human Health
– Ceramics for Sustainable Transportation and Infrastructure
– Role of Advanced Ceramic Technologies in Solving Global Water Problems
– Global Resource Management for Sustainable Development
– Other Emerging Ceramic Technologies

All the Fulrath award winners from Japan and USA, over the last three decades, are invited to make presentations in their specific areas of interest and highlight specific contributions they have made to better the lives of people and promoted the technical exchange and friendships.

Symposium Organizers

Mrityunjay Singh, Ohio Aerospace Institute, NASA Glenn Research Center, USA
N. Ichinose, Waseda University, Japan
M. Naito, Osaka University, Japan
Andrew L. Gyekenyesi, Ohio Aerospace Institute, NASA GRC, USA
Y. Imanaka, Fujitsu Corporation, Japan
N. Ohasi, National Institute of Materials Science, Japan
Roger Narayan, North Carolina State University, USA

Points of Contact:
Mrityunjay Singh, (216) 433-8883; mrityunjay.singh-1@nasa.gov
N. Ichinose, ichinose@waseda.jp

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